



Ontology-Driven Legal Support-System in the Air Transport Passenger Domain

International Workshop on Semantic Web for the Law
within



JURIX

The Foundation for Legal Knowledge Based Systems

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The Air Transport Passenger domain

- ~ 800M passengers transported in the EU per year
- ~100k complaints received in the NEBs per year

¿Le han cancelado el vuelo?

Sus derechos como pasajero al alcance de la mano

¿Vuelo retrasado o cancelado? ¿Equipaje extraviado? ¿Embarque denegado?

Las compañías aéreas tienen la obligación legal de informarte sobre **sus derechos y dónde reclamar**

¿Ha tenido alguno de estos problemas? La legislación de la UE protege sus intereses cuando viaja por Europa

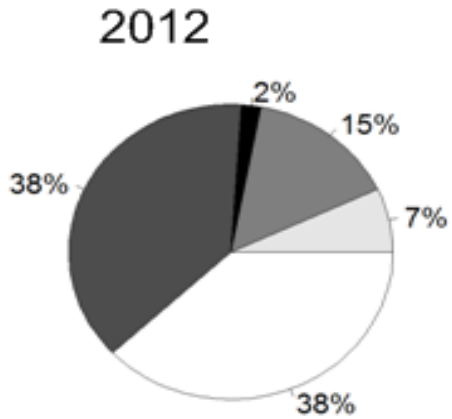
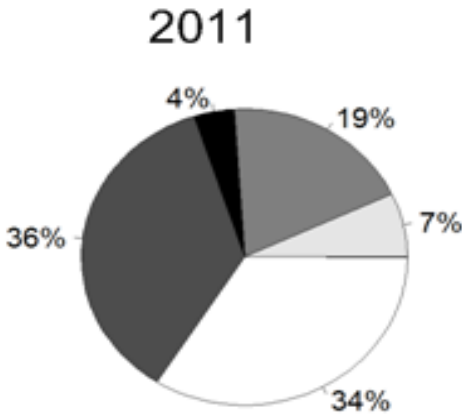
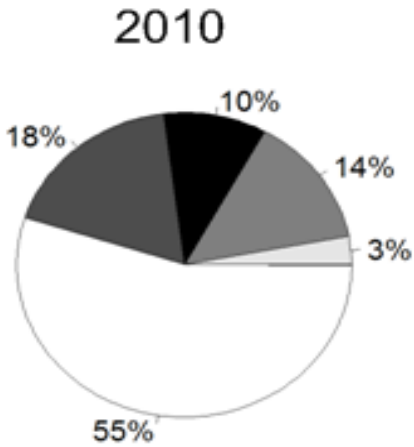
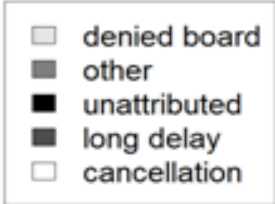
Más información en ec.europa.eu/passenger-rights

o a través de Europe Direct: 00 800 6 7 8 9 10 11

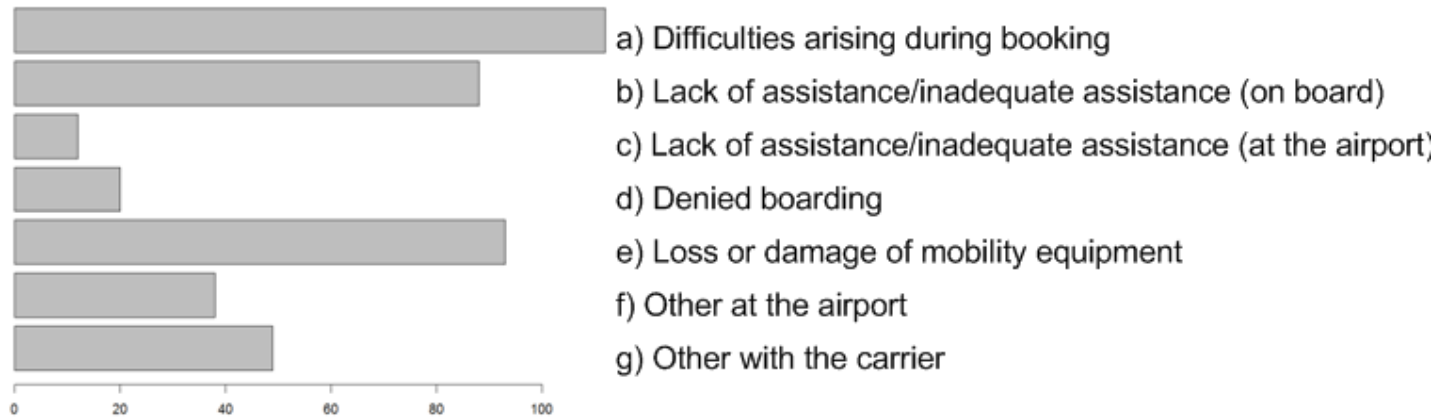
COMISIÓN EUROPEA

- Cancelled flights
- Delayed flights
- Denied boarding
- Baggage (delayed, damaged, lost...)
- Service incidents

Grounds for lodging complaints



Grounds for lodging complaints





Flightright alone claims to have supported >400,000 passengers!
AirHelp has supported >25,000 passengers

Limitations of companies providing assistance

- Do not handle baggage claims, nor service complaints
- Look for their own interest, disregarding some cases
- Do not provide link to the legal sources
- Do not go beyond the minimum compensation
- Do not consider case law
- Do not consider best practices and recommendations

—Thesis: **Ontologies may assist in the evaluation and decision-making process.**

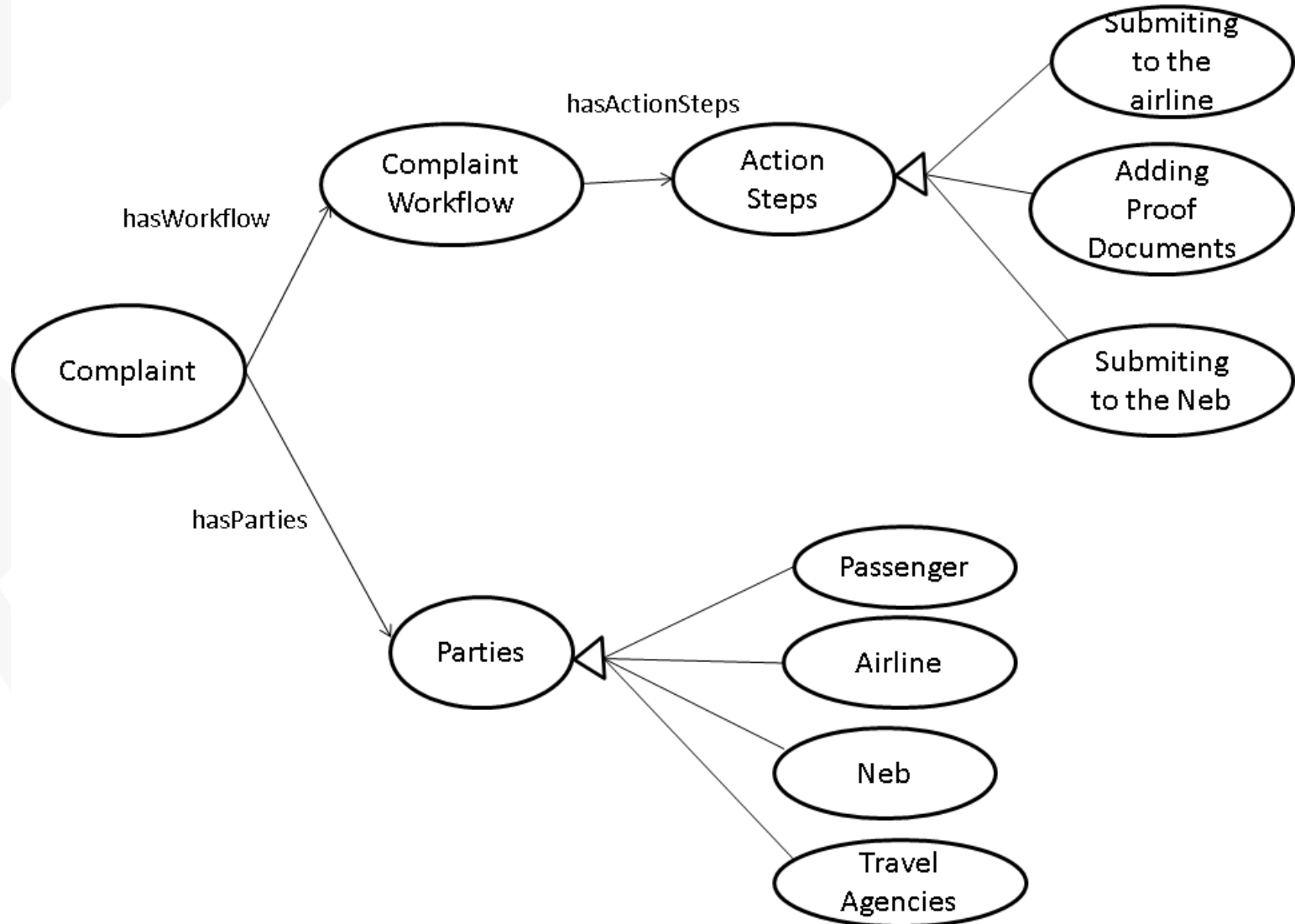
Advantages:

- Provide neutral information
- Transparency: the rules can be made public, re-usable by third parties
- Ease of update: ontologies easier to maintain than dedicated source code
- Favour the development of automated applications
- Incidents are more accessible, a comprehensive database of anonymized complains is possible

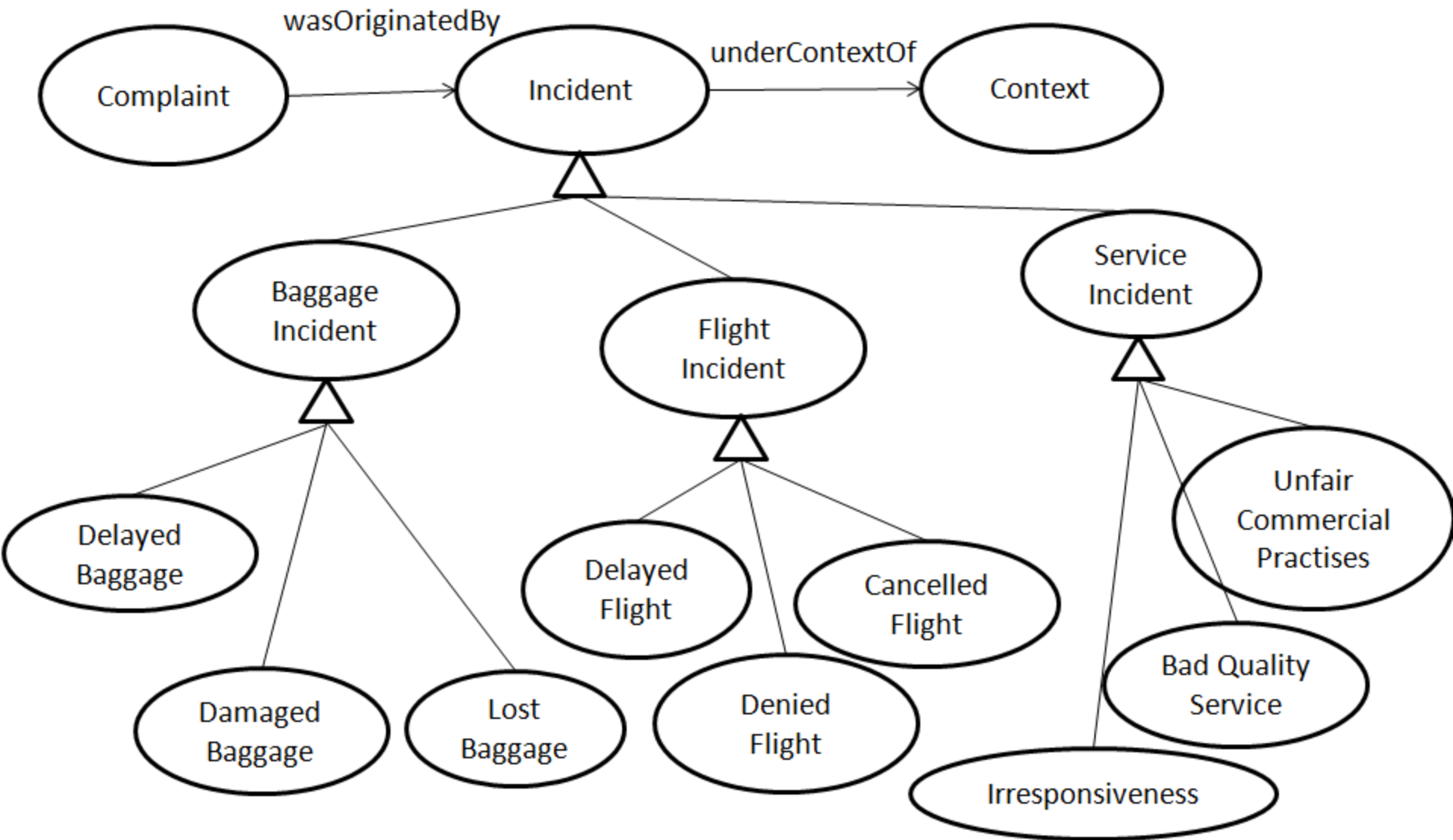
- **Purpose:** enhance the decision-making process through an ontology-driven support system, in the air transport passenger incidents and rights.
- **Requirements:**
 - 1) Does the passenger present a relevant incident?
 - 2) Which is the procedure to follow in case of a dispute?
 - 3) How can the passenger lodge a complaint?
 - 4) Which are the documents the passenger needs to sustain the claim?
 - 5) To whom to address the claim?
 - 6) When is the passenger eligible for redress?
 - 7) Which are the passenger's rights in case of flight cancelation, delay and overbooking?
 - 8) Which is the applicable legislation?
 - 9) The ontology supports scenarios in the English language.
 - 10) The ontology is based on European legal framework.

- Methontology, iterative process for the ontology design
- Sources:
 - Regulation (EC) No 261/2004, establishing common rules on compensation and assistance to passengers in the event of denied boarding and of cancellation or long delay of flights.
 - Commission Staff Working Document: “*Complaint handling and enforcement by Member States of the Air Passenger Rights Regulations*“
 - The 2011 ECC-NET Air Passenger Rights Report disclosed by the European Parliament
 - Bureau Européen des Unions de Consommateurs (BEUC) position on Air Passengers’ Rights, Revision of Regulation 261/04
 - Case-law from the European Court of Justice
 - Terms and conditions of 10 air-carriers
 - Analysis of actual passenger complaints

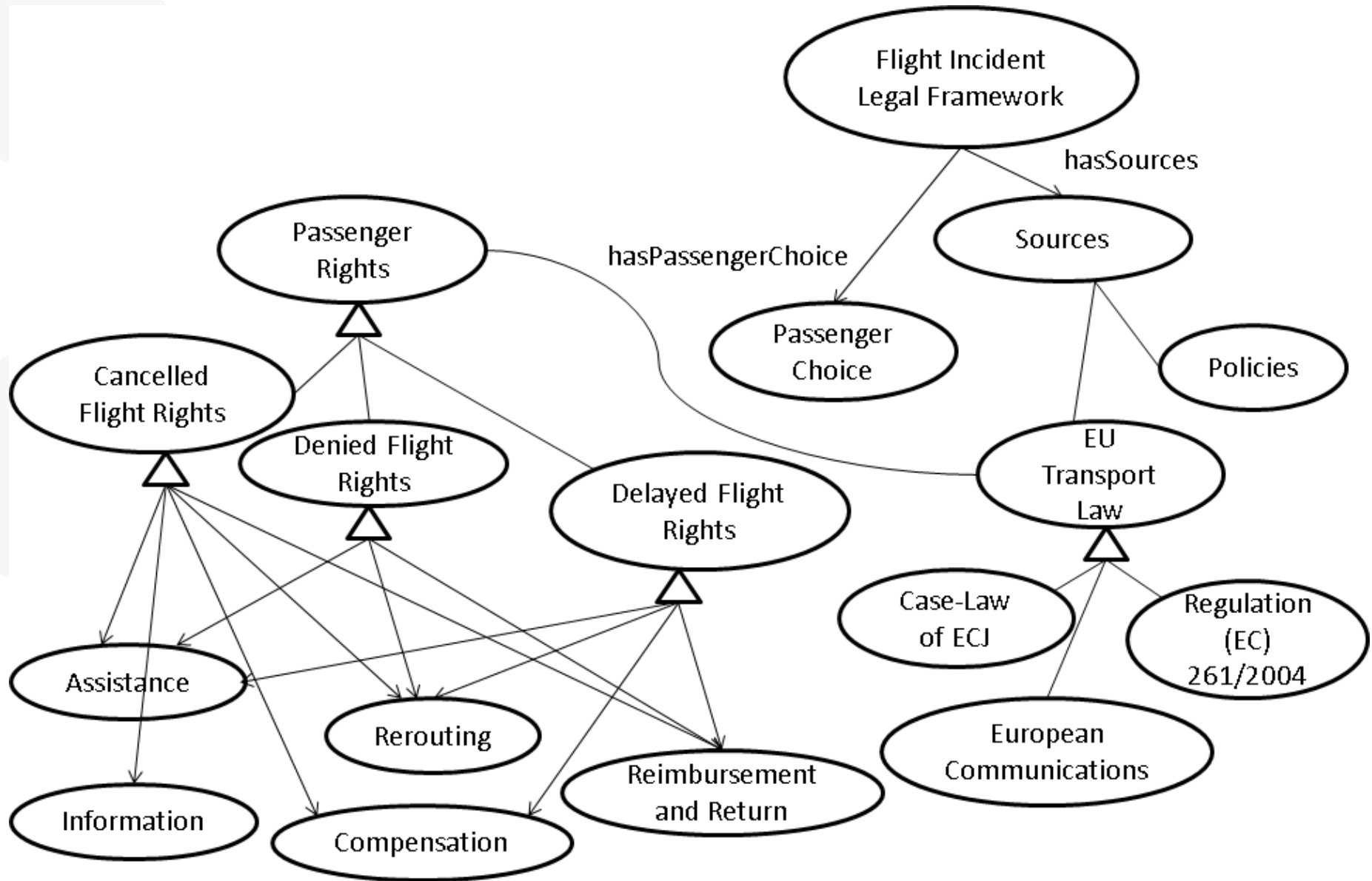
Complaint Workflow Ontology



Flight Incident Ontology



Flight Incident Legal Framework Ontology



Automatic complaint processing tool

"Air Transport Passenger Incidents and Rights"



File Data Help

id	data	fets	pe...	...	catego
20	22/06/07	Incompliment dels terminis d'en...	Re...		
56	26/06/07	Vull queixar-me del tracte humili...	De...		service
57	26/06/07	Air EuropaNúmero de Reclamaci...	Co...		service
81	29/06/07	Retard de 7 hores en l'avió que ...	De...		delayed
87	29/06/07	Día 29 junio vuelo JK5728 hora ...	Re...		delayed
92	1/07/07	Tenia un bitllet per volar a Vien...	Vul...		cancelled
102	3/07/07	El vol que havia de sortir de Lis...	Qu...		delayed
105	3/07/07	El vuelo con nº XG 1011 del día ...	- R...		delayed
131	6/07/07	El 20/04/07 vam realitzar una r...	Qu...		cancelled
134	6/07/07	El passat dia 24 de juny de 200...	Do...		baggage
140	9/07/07	EL 16/06/07 COMPRE UNA SILLI...	AL ...		
148	10/07/07	Hola,Despues de haber contacta...	Qu...		cancelled
165	10/07/07	1. El sábado 12 mayo no quisier...	Qu...		
168	11/07/07	El dia 6 de juliol tenia una reser...	De...		delayed
180	11/07/07	Me cancelaron sin previo aviso ...	- Q...		cancelled
183	11/07/07	Hem arribat 1 minut tard per e...	Ma...		service
216	16/07/07	La nostra entrada al Parc va ser...	Qu...		
275	20/07/07	Mi nombre es Martín Tur, soy A...	El r...		service
349	25/07/07	Degut a l'apagada elèctrica, he ...	De...		
402	27/07/07	Aquesta reclamació correspon a...	De...		
433	27/07/07	El dilluns 25 de juny, el vol 3032...	En ...		delayed
435	27/07/07	El dilluns 25 de juny, el vol 3032...	En ...		
484	30/07/07	Quan ens van portar la compta ...	Tot...		
506	30/07/07	Mi reclamación es referente a n...	Es...		service
554	30/07/07	Perdida de equipajes en un vuel...	Mi ...		baggage
637	1/08/07	Degut a les vagues salvatges de...	-D...		delayed
643	1/08/07	RETARD DE MÉS DE 5 HORES E...	NO...		delayed
650	1/08/07	En el mes de mayo de llega una...	Por...		
660	2/08/07	Queixes sobre deficiències diver...	Qu...		
667	2/08/07	El dia 22/07/07 a l'establiment P...	Qu...		
671	2/08/07	Tenia el vol reservat per sortir e...	Se...		cancelled
678	2/08/07	RETARD DE MÉS DE 5 HORES E...	NO...		delayed
681	2/08/07	Divendres dia 27 de juliol del 20...	De...		baggage
692	3/08/07	Me desplazé de Barcelona a Ma...	1/ ...		baggage
699	3/08/07	el 14 de Julio de 2007 mi hija el...	Pe...		service
701	3/08/07	Movistar, en la seva facturació d...	De...		
750	8/08/07	Se compró un billete pagando a...	El ...		
754	8/08/07	Mediante vuelo el día 17 de dici...	ten...		cancelled

Complaint

56

Vull queixar-me del tracte humiliant i vexatori de les dues persones que atendien els mostradors de facturació 7 i 8 de l'aeroport de Reus (zona de baix cost) el dia 26 de juny entre les 15.00 i les 17.00. En dirigir-me a elles en català van ignorar-me i en fer-los notar la seva actitud immediatament van cridar a seguretat i em van amenaçar de no deixar-me pujar a l'avió si no em dirigia a elles amb correcció -suposo que es refereien en espanyol- i, a sobre, els havia de demanar disculpes públicament, perquè segons deien les havia insultat. Curiosament, aquesta actitud no va venir de la persona que m'estava atenent al mostrador 7, només puc dir que tenia uns 30 anys i era de raça negra, si no d'una companya que estava al seu costat, al mostrador 8, també d'uns trenta i pico i amb ulleres, i que en cap moment havia participat en la conversa. Vaig demanar la presència d'un superior de l'aeroport que després d'una hora de discussió va obligar-les a fer la facturació. En aquesta hora, les dues persones van seguir inventant arguments per evitar-ho. Personal de l'aeroport, ens va informar que possiblement les dues persones en qüestió no pertanyien a Ryanair si no a una empresa que els dona aquest servei.

Flight company: Iberia

Communitary: Yes

Delay: <4 hours

[View Compensation and Rights](#)

- Three ontologies to model three different domains
- PURLs, foreseeing publication of Linked Data
- SWRL rule-based system to trigger information

```
Incident(?i) ^ hasFlight(?i, ?f) ^ IntraCommunityFlight(?f) ^  
hasParty(?i, ?p) ^ CancelledFlight(?f) ^  
reasonForCancellation(?x, "Extraordinary circumstances")  
=>rightTo(?p, :assistance) ^ rightTo(?p, :information) ^  
rightTo(?p, ;refundOrRerouting)
```

Ontology	prefix	IRI
Flight Incident	atpir-fi	http://purl.org/NET/atpir-fi
Complaint Workflow	atpir-cw	http://purl.org/NET/atpir-cw
Flight Incident Legal Framework	atpir-filf	http://purl.org/NET/atpir-filf

Conclusions

- Classification tasks are fallible by nature
- Automated reasoning is fallible due to incomplete information
- Hence we propose a **semi-automated** process
- Simple approach may suffice
 - Disregarded ontology patterns to represent temporal information

Future Work

- Detailed link to legal sources
- Ontology population with individuals (air carriers, etc.)
- Ontology validation from different perspectives
- More detailed handling of exceptional circumstances
- Potential usefulness for other parties



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